

User Advisory Group to the National Space Council



James O. Ellis Jr. – UAG Chairman

Retired as president and chief executive officer of the Institute of Nuclear Power Operations (INPO), in Atlanta, Georgia, on May 18, 2012. In 2004, Admiral Ellis completed a distinguished thirty-nine-year navy career as commander of the United States Strategic Command during a time of challenge and change. In this role, he was responsible for the global command and control of United States strategic and space forces, reporting directly to the secretary of defense. Ellis holds a master's degree in aerospace engineering from the Georgia Institute of Technology and, in 2005, was inducted into the school's Engineering Hall of Fame. He completed United States Navy Nuclear Power Training and was qualified in the operation and maintenance of naval nuclear propulsion plants. He is a graduate of the Navy Test Pilot School and the Navy Fighter Weapons School (Top Gun). In 2013, Ellis was elected to the National Academy of Engineering.

User Advisory Group to the National Space Council



Dr. Mary Lynne Dittmar

President and CEO of the Coalition for Deep Space Exploration, an industry trade group supporting human exploration, development, and science in deep space. She is also President and CEO of Dittmar Associates, a consulting firm that she founded in 2004.

Prior to starting Dittmar Associates, Mary Lynne worked for The Boeing Company where she coordinated payload interface development, operations development, and technology development projects destined for the International Space Station. Beginning in 1999, she managed the Flight Operations Group, overseeing systems integration and procedural development for assembly, activation and checkout of roughly 1/3 of the ISS assembly flights.

Later, she acted as a special advisor to the NASA Astronaut Office before her appointment as Boeing's first Chief Scientist for Commercial Utilization of the ISS. Dr. Dittmar is a Fellow of the National Research Society, an Associate Fellow of the American Institute for Astronautics and Aeronautics, and is a member of the Board of Directors of the American Astronautical Society. From 2012-2014 she served as a member of the National Research Council Committee on Human Spaceflight and is a co-author of the "Pathways to Exploration" report produced by the NRC in 2014 and is beginning her second term as a member of the Executive Committee of the Space Studies Board of the National Academies of Sciences, Engineering and Medicine. She resides in Washington, D.C.

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Eric Stallmer

President of the Commercial Spaceflight Federation. The CSF is the largest trade organization representing over 75 organizations, dedicated to promoting the development of commercial spaceflight, pursue ever-higher levels of safety, and share best practices and expertise throughout the industry.

As CSF President, Stallmer develops the strategy, plans and communications for the organization and works closely with CSF member companies to advocate for the commercial space industry. Prior to joining CSF, Stallmer served as the Vice President of Government Relations at Analytical Graphics Inc. (AGI). Stallmer came to AGI from The Space Transportation Association (STA), a nonprofit, industry trade organization providing government representation to companies with a vested interest in the U.S space launch industry. Prior to that, Stallmer worked on Capitol Hill in the office of then Congressman Tom Coburn.

For over two decades, Stallmer has served as an Officer in the United States Army and Army Reserves. He was awarded the Bronze Star Medal for meritorious service while engaged in combat operations during Operation Iraqi Freedom. He is currently assigned to the Pentagon in the office of the Deputy Chief of Staff Army for Logistics, G-4. Stallmer earned a Masters of Arts Degree in Public Administration from George Mason University and a Bachelor of Arts Degree in Political Science and History from Mount Saint Mary College. He and his wife Amy live in McLean, Virginia with their three children, Charlie, Billy and Catherine.

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General Lyles

Retired from the United State Air Force after a distinguished 35 year career, most recently as Commander, Air Force Material Command, Wright-Patterson Air Force Base, Ohio. Prior to that he served as Air Force Vice Chief of Staff and Chief Technology Officer, and Director of the Ballistic Missile Defense Organization at the Department of Defense.

He is a senior executive with over 26 years experience running large, high-technology organizations involved in aeronautical and astronautical research, development, acquisition and logistics. Gen. Lyles is a director of General Dynamics Corp., KBR Corp., Battelle and Precision Castparts Corp. He is a member of the NASA Advisory Council, the Defense Science Board and was elected to the National Academy of Engineers in 2011.

Lyles also serves as a member of the President's Intelligence Advisory Board in the White House. His awards include the Defense Distinguished Service Medal, Distinguished Service Medal, Defense Superior Service Medal and Legion of Merit. Lyles received a bachelor's degree in mechanical engineering from Howard University. He received a master's degree in mechanical/nuclear engineering, as well as honorary doctors of laws, from New Mexico State University and Urbana University.

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Dr. David Wolf,

28-year NASA veteran and astronaut, has spent 168 days in space and conducted seven spacewalks over four separate missions including Space Shuttles Columbia, Atlantis, Discovery, and Endeavor as well as the International Space Station, Russian Space Station MIR, and Spacelab. Prior to being selected as an astronaut, he led teams producing medical research instrumentation for spaceflight, including novel state of the art technology for three-dimensional tissue engineering.

Wolf's initial work at NASA stemmed directly from his research while at Purdue in medical ultrasonics. A medical doctor, electrical engineer, and inventor, Wolf has been awarded 17 U.S. patents, received the NASA Exceptional Engineering Achievement Medal, and was named the NASA Inventor of the Year.

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Eileen Collins

Collins graduated in 1979 from Air Force Undergraduate Pilot Training at Vance AFB, Oklahoma, where she was a T-38 instructor pilot until 1982. She was a C-141 aircraft commander and instructor pilot, a student with the Air Force Institute of Technology, and was assigned to the U.S. Air Force Academy as an assistant professor in mathematics and a T-41 instructor pilot. She was selected for the astronaut program while attending the Air Force Test Pilot School at

Edwards AFB, California, from which she graduated in 1990. Collins retired from the Air Force in January 2005.

Selected by NASA in January 1990, Collins became an astronaut in July 1991. Initially assigned to Orbiter engineering support, Collins has also served on the astronaut support team responsible for Orbiter prelaunch checkout, final launch configuration, crew ingress/egress, landing/recovery, worked in Mission Control as a spacecraft communicator (CAPCOM), served as the Astronaut Office Spacecraft Systems Branch Chief, Chief Information Officer, Shuttle Branch Chief, and Astronaut Safety Branch Chief. Collins served as pilot on STS-63 (February 3-11, 1995) and STS-84 (May 15-24, 1997), and was the commander on STS-93 (July 22-27, 1999) and STS-114 (July 26 to August 9, 2005). A veteran of four space flights, Collins has logged over 872 hours in space. Collins retired from NASA in May 2006.

Collins graduated from Elmira Free Academy, Elmira, New York, in 1974; received an associate in science degree in mathematics/science from Corning Community College in 1976; a bachelor of arts degree in mathematics and economics from Syracuse University in 1978; a master of science degree in operations research from Stanford University in 1986; and a master of arts degree in space systems management from Webster University in 1989.

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Pamela Melroy

Col Melroy was commissioned through the Air Force Reserve Officers' Training Corps (ROTC) program in 1983. After completing a Master's degree, she attended undergraduate pilot training at Reese Air Force Base in Lubbock, Texas, and graduated in 1985. Melroy flew the KC-10 for six years at Barksdale Air Force Base in Bossier City, Louisiana, as a co-pilot, aircraft commander and instructor pilot. In June 1991, she attended the Air Force Test Pilot School at Edwards Air

Force Base, California.

Upon her graduation, she was assigned to the C-17 Combined Test Force, where she served as a test pilot until her selection for the Astronaut Program. Colonel Melroy retired from the Air Force in February 2007. Selected as an astronaut candidate by NASA in December 1994, Colonel Melroy completed a year of training and evaluation and was qualified for flight assignment as a shuttle pilot. Initially assigned to astronaut support duties for launch and landing, she also worked advanced projects for the Astronaut Office. Colonel Melroy served on the Columbia Reconstruction Team as the lead for the crew module and served as Deputy Project Manager for the Columbia Crew Survival Investigation Team.

In her final position, she served as Branch Chief for the Orion branch of the Astronaut Office. Colonel Melroy served as pilot on two flights (STS-92 in 2000 and STS-112 in 2002) and was the mission commander on STS-120 in 2007, making her one of only two women who commanded the space shuttle.

She has logged more than 924 hours (more than 38 days) in space. Colonel Melroy left the agency in August 2009 and currently serves as Deputy Director, Tactical Technology Office at the Defense Advanced Research Projects Agency (DARPA). She graduated from Bishop Kearney High School, Rochester, New York, in 1979. Bachelor of Arts degree in Physics and Astronomy from Wellesley College, 1983. Master of Science degree in Earth and Planetary Sciences from Massachusetts Institute of Technology, 1984.

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Eric Schmidt

Schmidt has served as the Executive Chairman of Alphabet's board of directors since October 2015. He has served as the Executive Chairman of Google's board of directors since April 2011 and as a member of Google's board of directors since March 2001. From July 2001 to April 2011, Eric served as Google's Chief Executive Officer. He was the chairman of Google's board of directors from March 2001 to April 2004, and again from April 2007 to April 2011. Prior to joining Google, from April 1997 to November 2001, Eric served as chairman of the board of directors of Novell, Inc., a computer networking company, and, from April 1997 to July 2001, as the Chief Executive Officer of Novell. From 1983 until March 1997, Eric held various positions at Sun Microsystems, Inc., a supplier of network computing solutions, including Chief Technology Officer from February 1994 to March 1997, and President of Sun Technology Enterprises from February 1991 until February 1994. Eric was previously a director of Apple Inc., a designer, manufacturer, and marketer of personal computers and related products, from 2006 to 2009. Eric holds a Doctoral degree and a Master of Science degree in computer science from the University of California, Berkeley, and a Bachelor of Science degree in electrical engineering from Princeton University.

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Marillyn A. Hewson

Ms. Hewson is Chairman, President and CEO of Lockheed Martin Corporation. Ms. Hewson joined Lockheed Martin more than 30 years ago as an industrial engineer. During her career she has held several operational leadership positions, including President of Lockheed Martin Systems Integration; Executive Vice President of Global Sustainment for Lockheed Martin Aeronautics; President and General Manager of Kelly Aviation Center, L.P., an affiliate of Lockheed Martin; and President of Lockheed Martin Logistics Services. She has also served in key corporate executive roles, including Senior Vice President of Corporate Shared Services; Vice President of Global Supply Chain Management; and Vice President of Corporate Internal Audit. Ms. Hewson has served on numerous boards and currently sits on the Board of Directors of DowDuPont, the Congressional Medal of Honor Foundation, the Board of Governors of the USO, and the Board of Directors of Catalyst. She is a member of The University of Alabama's President's Cabinet and also serves on the Board of Visitors of the Culverhouse College of Commerce and Business Administration. In 2017, Fortune magazine identified Ms. Hewson as No. 3 on the "50 Most Powerful Women in Business." She has also been recognized as a Top 10 "Businessperson of the Year" by Fortune, as one of the "World's 100 Most Powerful Women" by Forbes, and as one of the "Bloomberg 50" – the leaders who defined 2017. Born in Junction City, Kansas, Ms. Hewson earned her Bachelor of Science degree in business administration and her Master of Arts degree in economics from the University of Alabama. She also attended the Columbia Business School and Harvard Business School executive development programs.

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Mr. Dennis A. Muilenburg

Mr. Muilenburg is Chairman, President & Chief Executive Officer at The Boeing Co., Chairman at Aerospace Industries Association, Chairman, President and Chief Executive Officer at Boeing HorizonX and President at The Boeing Co. (Illinois).

He is on the Board of Directors at US-China Business Council, Caterpillar, Inc., Congressional Medal of Honor Foundation, For Inspiration & Recognition of Science & Technology, US Foundation for Inspiration & Recognition of Science & Tech, Association of the

United States Army, The National World War II Museum, Inc. and Washington University in St. Louis. Mr. Muilenburg was previously employed as President & Chief Executive Officer by Boeing Defense, Space & Security, President by Boeing Ventures, and Executive Vice President by Boeing Capital Corp. He received his undergraduate degree from Iowa State University and a graduate degree from the University of Washington.

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Wes Bush

Mr. Bush is chairman and chief executive officer of Northrop Grumman Corporation, a leader in global security. He has served as chief executive officer since January 2010, and as chairman since July 2011. Prior to 2010, Bush served as the president and chief operating officer of the company. Before that, he served as the corporate vice president and chief financial officer, and, earlier, as the president of the company's Space Technology sector.

Prior to the acquisition of TRW by Northrop Grumman, he had served since 2001 as president and chief executive officer for TRW's UK-based global Aeronautical Systems. Bush joined TRW in 1987 as a systems engineer, and served in engineering, program management and business development roles in TRW's Space & Electronics business. Prior to joining TRW, he held engineering positions with both the Aerospace Corporation and Comsat Labs. Bush earned a bachelor's degree and a master's degree in electrical engineering from the Massachusetts Institute of Technology.

He also completed the University of California, Los Angeles' Executive Management Program. Bush serves on the board of directors of Norfolk Southern Corporation, as well as the boards of several nonprofit organizations, including the Aerospace Industries Association, the Business-Higher Education Forum, Conservation International, the U.S. Naval Academy Foundation, the Inova Health System and the USO Board of Governors.

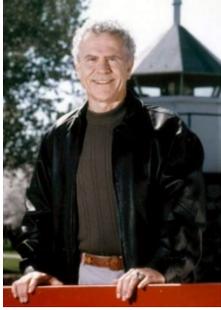
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Steve Crisafulli

Speaker Crisafulli is a former Republican member of the Florida House of representatives, representing District 51 from 2008 to 2016. He served as Speaker of the House and was Majority Leader in 2014. Crisafulli did not seek re-election to the Florida House of Representatives in 2016 because of term-limits. Crisafulli served as Supervisor of Brevard County Soil and Water Conservation from 1998 to 2002.

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Homer H. Hickam, Jr.

Mr. Hickam graduated from Big Creek High School in 1960 and from the Virginia Polytechnic Institute (Virginia Tech) in 1964 with a BS degree in Industrial Engineering. A U.S. Army veteran, Mr. Hickam served as a First Lieutenant in the Fourth Infantry Division in Vietnam in 1967-1968 where he won the Army Commendation and Bronze Star medals. He served six years on active duty, leaving the service with the rank of Captain. Hickam has been a writer since 1969 after his return from Vietnam. His latest work, published in October, 2015, is the critically acclaimed novel *Carrying Albert Home: The Somewhat True Story of a Man, his Wife, and her Alligator*. While working on his writing career, Mr. Hickam was employed as an engineer for the U.S. Army Missile Command from 1971 to 1981 assigned to Huntsville, Alabama, and Germany. He began employment with the National Aeronautics and Space Administration at Marshall Space Flight Center in 1981 as an aerospace engineer. During his NASA career, Mr. Hickam worked in spacecraft design and crew training. His specialties at NASA included training astronauts on science payloads, and extravehicular activities (EVA). He also trained astronaut crews for many Spacelab and Space Shuttle missions, including the Hubble Space Telescope deployment mission, the first two Hubble repair missions, Spacelab-J (the first Japanese astronauts), and the Solar Max repair mission. Prior to his retirement in 1998, Mr. Hickam was the Payload Training Manager for the International Space Station Program. In 1984, Mr. Hickam was presented with Alabama's Distinguished Service Award for heroism shown during a rescue effort of the crew and passengers of a sunken paddleboat in the Tennessee River. Because of this award, Mr. Hickam was honored in 1996 by the United States Olympic Committee to carry the Olympic Torch through Huntsville, Alabama, on its way to Atlanta. Mr. Hickam is married to Linda Terry Hickam, an artist and his first editor and assistant.

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Mr. Fred Klipsch

Founder and Chairman of Hoosiers for Quality Education, an organization that seeks systemic education improvement and economic growth in Indiana, where he has held his position since 2007. Mr. Klipsch also serves as a director of The Friedman Foundation for Educational Choice, a non-profit organization that educates families on school choice, and the Philanthropy Roundtable.

From 2011 to 2014, Mr. Klipsch was Chairman of Klipsch Group, Inc. and from 1989 until 2011, he was Chairman, Chief Executive Officer and majority owner of Klipsch Group, Inc. From 1982 until 1989, Mr. Klipsch was Executive Vice President, Chief Operating Officer and Chief Development Officer of Forum Group Inc. From 1989 until 1996, Mr. Klipsch was Chairman and majority owner of National Guest Homes.

In addition, Mr. Klipsch was Chairman and majority owner of Hospital Affiliates Development Corporation (HADC) from 1989 until 2002, at which time it became part of Windrose Medical Properties Trust. Mr. Klipsch served as Chairman and Chief Executive Officer of Windrose Medical Properties Trust from its formation and initial public offering in 2002 until December 2006, when Windrose Medical Properties Trust merged with the Company.

Mr. Klipsch served as Vice Chairman of the Company from December 2006 until May 2009. In addition to his significant global operational and leadership experiences with Klipsch Group, Inc., Mr. Klipsch has extensive knowledge of the hospital, medical office building, retirement center, assisted living and nursing home sectors from his ownership and operational experiences and leadership roles with the Forum Group Inc., National Guest Homes, HADC, Windrose Medical Properties Trust and the Company.

He received his B.S. from Purdue University and is a Purdue Honorary PhD. recipient. Mr. Klipsch's qualifications to serve on the Board include his extensive business experience in both the public and private sector as well as his leadership roles in several philanthropic organizations.

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Stuart Witt

As General Manager, East Kern Airport District (California), Stuart Witt was the force behind the Mojave Desert's primacy in the space business, as home to XCOR Aerospace, Scaled Composites, Rotary Rocket, Orbital Sciences L1011 Stargazer, Masten Space, Air Launch and Protoflight, Lunar Tech, Rocket Propulsion, and other space-related start-ups. Witt has been directing the expansion efforts of the Mojave Air and Space Port since 2002, dealing with everything from road and water system upgrades to runway, taxiway, lighting, communication, security and ground and air route flow with FAA regulators, commercial builders and state and county planners. Born in Bakersfield, CA, and raised at Scodie Ranch in the central Sierra Nevada Mountains, Witt is a long-time aviator. He obtained his private pilot's license in 1971, graduated from Cal State Northridge in 1974, from the Naval Aviation Schools Command in 1976 and from the Naval Fighter Weapons School (TOPGUN training) in 1980; he is also a 1996 graduate of the University of Maryland's Center for Creative Leadership. His military career took him to sea as an F-14 Tomcat pilot on based on U.S.S. John F. Kennedy and as an FA-18A project pilot at the Naval Air Warfare Center in China Lake, CA. After the Navy, Witt joined what was then Westinghouse Electric Corporation (now NGC) for nearly nine years as an engineering test pilot on the B-1B, F-16C and F-23. In 1993 he joined Computer Technology Associates, where he managed a \$100-million-range contract and was later promoted to EVP.

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Fatih Ozmen

CEO of Sierra Nevada Corporation (SNC) which is headquartered in Sparks, Nevada. Fatih Ozmen and his wife, Eren Ozmen, are the sole owners of SNC. Born in Turkey, the former Turkish National Cycling Champion rode alongside top Turkish cyclists throughout the 1970s. Fatih Ozmen pursued higher education in the United States receiving a M.S. Degree in Electrical Engineering from the University of Nevada, Reno. He started at Sierra Nevada Corporation as an Engineering intern in 1981. With a Master's thesis on navigation and landing systems, Fatih Ozmen was able to take part in the development of numerous systems and management of several key programs during his years at the Sierra Nevada Corporation. In 1994, Fatih Ozmen and his wife Eren Ozmen acquired the company. Under the ownership of Fatih Ozmen, Sierra Nevada Corporation has completed 19 strategic acquisitions, expanded the company to 34 locations in 19 U.S. states, England, Germany and Turkey,[8] and has grown to include workforce of nearly 3,000 personnel. The company is ranked one of the top performing Federal Contractors in the United States.

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Mr. David Thompson

President and Chief Executive Officer of Orbital ATK, a global leader in aerospace and defense technologies. With annual revenues of approximately \$5 billion and a workforce of more than 13,500 people in 2018, the company designs, builds and delivers space, defense and aviation-related systems for customers around the globe, both as a prime contractor and merchant supplier. Mr. Thompson co-founded one of Orbital ATK's predecessors, Orbital Sciences Corp., in 1982, and served as the company's Chairman, President and Chief Executive Officer. Before co-founding Orbital, Mr. Thompson was special assistant to the president of Hughes Aircraft Company's Missile Systems Group and was a project manager and engineer on advanced rocket engines at NASA's Marshall Space Flight Center. As a college student, he worked on the first Mars landing missions at Caltech's Jet Propulsion Laboratory and on Space Shuttle projects at NASA's Langley Research Center and Johnson Space Center. Mr. Thompson is an Honorary Fellow of the American Institute of Aeronautics and Astronautics (AIAA), a Fellow of the American Astronautical Society and the Royal Astronautical Society, and a member of the U.S. National Academy of Engineering and the International Academy of Astronautics. He was AIAA's President for the 2009-2010 year. He received a B.S. in Aeronautics and Astronautics from Massachusetts Institute of Technology, a M.S. in Aeronautics from California Institute of Technology (Caltech), and a M.B.A. from Harvard Business School. He also serves as a member of the Boards of Trustees of Caltech and the Carnegie Institution, as well as the Astronomy Advisory Council at Princeton University.

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Ms. Gwynne Shotwell

President at Space Exploration Technologies Corp. since December 2008 and serves as its Chief Operating Officer. Ms. Shotwell served as Vice President of Business Development of Space Exploration Technologies Corporation from 2002 to December 2008. Her responsibilities include developing the customer base for SpaceX vehicles and managing strategic relationships. Her experience over ten years at the Aerospace

Corporation, where she held positions of increasing responsibility in Space Systems Engineering and Technology and Project Management. She served as the Chief Engineer of an MLV-class Satellite program, managing a landmark study for the Federal Aviation Administration's on Commercial Space Transportation and completing an extensive space policy analysis for NASA's future investment in space transportation. After Aerospace Corporation, she served as a Manager of the Space Systems Division at Microcosm, where she served on an Executive Committee and directed corporate business development. She also serves as an Officer of the Space Systems Technical Committee of the AIAA. She began her engineering career at Chrysler Motors. In 2004, she was elected to the California Space Authority Board of Directors. She serves as a Member of Advisory Committee at Export-Import Bank of the United States. She serves as a Member of Board of Governors at Aerospace Industries Association. Ms. Shotwell received Bachelor's and Master's Degree from Northwestern University in Mechanical Engineering and Applied Mathematics.

<https://www.bloomberg.com/research/stocks/private/person.asp?personId=39083380&rivcapId=7702894>

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Bob Smith, CEO Blue Origin

Bob is currently the CEO of Blue Origin. He feels it's a great privilege to be part of an amazing team that is building reusable launch vehicles, modern powerful rocket engines and all the capabilities that will enable millions of people to live and work in space. He was previously the President of Mechanical Systems and Components at Honeywell Aerospace. This business unit produces air & thermal systems, wheels and brakes, engine/missile/space components and actuation and also manages its DoE businesses.

Bob was also CTO for Honeywell Aerospace from 2009-2016. He was responsible for the product development, innovation and business execution for the engineering function comprising 12,000 engineers worldwide. Prior to that, he was the VP of Advanced Technology for Honeywell Aerospace. In that role, he set technology growth strategies for Honeywell's \$12B aerospace business, won government technology contracts and managed the multi-year technology programs. At United Space Alliance (1999-2004), Bob served as Executive Director of the Space Shuttle Upgrades Development Program. Bob also worked at The Aerospace Corporation. He served as a guidance, navigation & control analyst and a program manager for a number of DoD and national security programs. He eventually became the Systems Director of the NASA Programs Office and the site manager for Houston operations. In that capacity, he served as the business leader for all of Aerospace's efforts at each of the major NASA centers. He has degrees in engineering/applied mathematics/business from Texas A&M, Brown University and MIT's Sloan School of Management. He also has a Ph.D. from the University of Texas in aerospace engineering.

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Mandy Vaughn, President at VOX Space

Mandy Vaughn is the President of VOX Space. Mandy originally joined Virgin Orbit, VOX Space's parent company, in 2015. As Senior Director of Business Development and Mission Management, she supported business development on the LauncherOne program for both government and commercial customers, and served as mission manager for customers including OneWeb and NASA, in addition to spearheading the creation and registration of VOX Space.

Prior to joining Virgin Orbit, Mandy was with General Dynamics Mission Systems' Space and Intelligence Systems Directorate, where she was responsible for the space control and space protection investment portfolios and analog-to-digital transitions for a variety of SIGINT payload families. She successfully initiated development programs for the next-generation space-based GPS receiver and managed the internal investment of GPS payload development efforts.

Prior to joining General Dynamics, she was a developmental engineer and program manager in the Air Force and a Director with Kinsey Technical Services. She primarily supported programs in the Space Superiority Systems Directorate (SMC/SY) at Los Angeles AFB, CA and earlier the ICBM system program office at Hill AFB, UT. In the Space Superiority mission area, she was the ground segment lead and chief engineer on the Space-Based Space Surveillance program, and then supported a variety of space and ground-based programs for the Directorate. In that role, she supported a multiple Space Situational Awareness and command and control programs supporting integration of requirements and demonstrations between the DoD and the intelligence community. She supported the NRO AS&T and DIA Directorate of Science and Technology in a variety of collection campaigns that spanned various collection system phenomena to demonstrate new systems and operational concepts for critical space operations.

Mandy has a BS in Mechanical Engineering and an MS in Aeronautics and Astronautics, both from MIT.

User Advisory Group to the National Space Council



President and CEO, United Launch Alliance

Salvatore T. "Tory" Bruno is the president and CEO for United Launch Alliance (ULA). In this role, Bruno serves as the principal strategic leader of the organization and oversees all business management and operations. Prior to joining ULA, he served as the vice president and general manager of Lockheed Martin Strategic and Missile Defense Systems. He is a former member of the board of directors of Lockheed Martin U.K. Ltd.

Bruno joined Lockheed Martin in 1984. He previously served as vice president and general manager of FBM and ICBM. He holds a bachelor's degree in mechanical engineering from the California Polytechnic State University, in San Luis Obispo, California, and has completed graduate courses and management programs at Harvard University, Santa Clara University, the Wye River Institute, San Jose State University and the Defense Acquisition University. Bruno is an American Institute of Aeronautics and Astronautics (AIAA) Fellow, a companion of the Naval Order of the United States, a member of the Navy League and a former member of the Board of Directors of the Silicon Valley Leadership Group. He served on the National Blue Ribbon Panel for Bettering Engineering & Science Education and as Chairman of the Diversity Council of Lockheed Martin Space Systems. He is the author of two books that explore the organization of the medieval Knights Templar from the perspective of modern business management: "Templar Organization: The Management of Warrior Monasticism" and "Templar Incorporated." He is a recipient of the Order of Merit of the Sovereign Military Order of the Temple of Jerusalem.

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Pamela Vaughan

Arkansas School Teacher, Board Certified

EDUCATION

National Board of Professional Teachers Certification Renewal, Adolescent and Young Adult Science, 2015

National Board of Professional Teachers Certification, Adolescent and Young Adult Science, 2005

Bachelor of Science in Education, biology major,

Henderson State University 1980

EXPERIENCE

Camden Fairview School District, Camden, Arkansas

District Science and Math Specialist, 2012-present

Lockheed Martin Missiles Fire Control Teacher Summer Intern, Camden, Arkansas, First teacher selected as a summer intern at Camden location, researching the relationship between industry six sigma quality efforts and applications to education, summer 2010

Camden Fairview School District, Camden, Arkansas

District Science and high school science teacher, 2006- 2012-present

Fordyce School District, Fordyce, AR

Science Teacher grades 6-12, 1990-2006

Science Education Professional Development Presenter, Bob Bell and Associates

Leader of science professional development for elementary and middle school teachers throughout the state of Arkansas, 1986-1987

Mountain Pine School District, Mountain Pine, Arkansas Science Teacher grades 7-12, 1981-1984

RECOGNITION

2009 Contributing Author, *Today I Made a Difference, a Collection of Inspirational Stories from America's Top Educators*.

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Kay Ivey

Governor Ivey is the 54th and current Governor of Alabama. She was sworn into office on April 10, 2017, following the resignation of Gov. Robert J. Bentley (R). She previously served as lieutenant governor from January 2011 to April 2017. She was elected to the position in 2010 and re-elected in 2014. Ivey was the first Republican in the state's history to serve two consecutive terms in the lieutenant governor's office.

Initially a candidate for governor in 2010, Ivey switched to the lieutenant governor's race on March 31, 2010. She went on to defeat incumbent Jim Folsom, Jr. (D) by a slim margin in the general election on November 2, 2010. The victory made Ivey the first Republican woman to be elected lieutenant governor in the state's history. Ivey was first elected to statewide office in 2002, defeating Democratic opponent Stephen Foster Black in the general election to win election as state treasurer of Alabama.

She served two terms in this office before becoming lieutenant governor in 2011. Prior to entering public service, Ivey was director of government affairs for the Alabama Commission on Higher Education from 1985 to 1998, assistant director of the Alabama Development Office from 1982 to 1985 and a reading clerk for the Alabama House of Representatives from 1980 to 1982. Ivey was also assistant vice president of Merchants National Bank/Regions Bank from 1970 to 1979. Ivey was raised in Camden, Alabama. She attended Auburn University, Duke University's Governor's Center for Public Policy,

as assistant director of the Alabama Development Office.

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Buzz Aldrin

Commander Aldrin grew up in Montclair, New Jersey. Buzz graduated one year early from Montclair High School and he attended the US Military Academy at West Point, graduating third in his class with a BS in mechanical engineering. He then joined the Air Force where he flew F86 Sabre Jets in 66 combat missions in Korea, shot down two MIG-15's, and was decorated with the Distinguished Flying Cross. After a tour of duty in Germany flying F100's, he earned his Doctorate of Science in Astronautics at MIT and wrote his thesis on Manned Orbital Rendezvous. Selected by NASA in 1963 into the third group of astronauts, Aldrin was the first with a doctorate and became known as "Dr. Rendezvous."

The docking and rendezvous techniques he devised for spacecraft in Earth and lunar orbit became critical to the success of the Gemini and Apollo programs, and are still used today. He pioneered underwater training techniques to simulate spacewalking. In 1966 on the Gemini 12 orbital mission, Buzz performed the world's first successful spacewalk – extra-vehicular activity (EVA), and set a new EVA record of 5 1/2 hours. During that mission he also took the first 'selfie' in space. On July 20, 1969, Buzz and Neil Armstrong made their historic Apollo 11 moonwalk, becoming the first two humans to set foot on another world. An estimated 600 million people – at that time, the world's largest television audience in history – witnessed this unprecedented heroic endeavor. Since retiring from NASA and the U.S. Air Force, Col. Aldrin calls himself a Global Statesman for Space and has remained a tireless advocate for human space exploration.

User Advisory Group to the National Space Council



Harrison "Jack" Schmitt

Selected for the Scientist-Astronaut program in 1965, Schmitt organized the lunar science training for the Apollo Astronauts, represented the crews during the development of hardware and procedures for lunar surface exploration, and oversaw the final preparation of the Apollo 11 Lunar Module Descent Stage. He was designated Mission Scientist in support of the Apollo 11 mission. After training as back-up Lunar Module Pilot for Apollo 15, Schmitt served as Lunar Module Pilot for Apollo 17—the last Apollo mission to the moon. On December 11, 1972, he landed in the Valley of Taurus-Littrow as the only scientist and the last of 12 men to step on the Moon. In 1975, after two years managing NASA's Energy Program Office, Schmitt fulfilled a long-standing personal commitment by entering politics. Elected in 1976, he served a six-year term in the U.S. Senate beginning in 1977. Senator Schmitt, the only "natural scientist" in the Senate since Thomas Jefferson was Vice-President of the United States, was a member of the Senate Commerce, Banking, Appropriations, Intelligence, and Ethics Committees. In his last two years in the Senate, Schmitt held the position of Chairman of the Commerce Subcommittee on Science, Technology, and Space and of the Appropriations Subcommittee on Labor, Health and Human Services, and Education. Harrison Schmitt is currently Chairman of the NASA Advisory Council. He consults, speaks and writes on policy issues of the future, the science of the Moon and Planets, and the American Southwest. His scientific research concentrates primarily on the synthesis of data related to the origin and evolution of the Moon and the terrestrial planets and on the economic geology of the lunar regolith and its resources. Schmitt presently is Adjunct Professor of Engineering, University of Wisconsin-Madison, teaching "Resources from Space." Schmitt's book, "Return to the Moon—Exploration, Enterprise, and Energy in the Human Settlement of Space," was published by Springer in 2006. Since 1964, he has been the author of many scientific journal papers and book chapters related to exploration, space and lunar science.

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G.P. "Bud" Peterson

Mr. Peterson was appointed as the 11th president of Georgia Tech on April 1, 2009. Peterson came to Georgia Tech from the University of Colorado at Boulder, where he served as chancellor. Prior to that, he served as provost at Rensselaer Polytechnic Institute in New York, and on the faculty and in leadership positions at Texas A&M University for 19 years. He has worked for NASA and the National Science Foundation (NSF). A distinguished scientist, he was appointed in 2008 by President George W. Bush, and again in 2014 by President Barack Obama, to serve as a member of the National Science Board, which oversees the NSF and advises the president and Congress on national policy related to science and engineering research and education. In 2010 he was named by U.S. Secretary of Commerce Gary Locke as a member of the National Advisory Council on Innovation and Entrepreneurship. President Obama appointed him to the Advanced Manufacturing Partnership (AMP) steering committee in 2011, and to the AMP 2.0 steering committee in 2013. Peterson earned a bachelor's degree in mechanical engineering, a second bachelor's degree in mathematics, and a master's degree in engineering, all from Kansas State University. He earned a Ph.D. in mechanical engineering from Texas A&M University. He and his wife, Val, have four adult children, two of whom are Georgia Tech alumni.

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Tim Ellis

Tim is the Co-founder and CEO of Relativity Space, the first autonomous factory and launch service for rockets. Relativity recently created the largest metal 3D printer in the world and is working to print entire rockets. The company's long term mission is to sustain and scale an interplanetary society, including printing the first rockets made on Mars. Tim was previously responsible for bringing metal 3D printing in-house to Blue Origin, and was a propulsion development engineer on the crew capsule reaction control thrusters and the BE-4 engine. He is an alumnus of the University of Southern California where he played a leadership role in launching a fully student designed and built rocket into near space. Tim has spoken at TEDx and testified before the U.S. Senate on the importance of public-private partnerships to commercial space policy. Relativity is backed by Social Capital, Y Combinator, and Mark Cuban.